Summer/Fall 2010

The Southern Plains Cyclone

A newsletter from your Norman Forecast Office for the residents of western and central Oklahoma and western north Texas

OKC Flood

Also...

Research Experience for Undergraduates

Norman, OK, Damaging Downburst

Tropical Tornadoes...Earthquakes...80 Degree Dewpoints...& More!

Meet Your Weather Man → Vivek Mahale

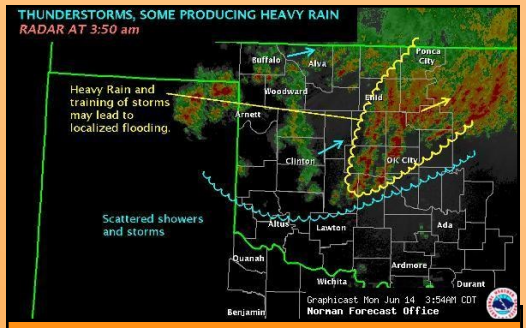
We Make the Difference...When it Matters Most!

OKC Under Water

By Andrew Taylor

General Forecaster

Imagine yourself as a weather forecaster. You wake up on a Monday morning to prepare for your first forecast shift in ten days. It is overcast with occasional light rain. You walk into the operations area; everyone is calm, but an unusual number of people are staffing the forecast desk. You glance up at the television monitors on the situational awareness display and see footage of a major flood event. For a split second you have to question whether this is some old footage. But when you realize the same thing is playing on all the major networks you know this must be occurring right now.



Graphicast from NWS Norman depicting the developing heavy rain and flash flood threat over central Oklahoma on June 14, 2010.

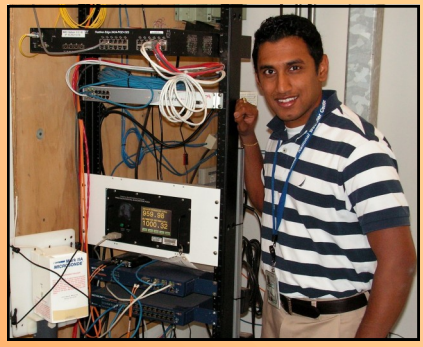
Cars are stranded, some vehicles are floating down streets that have become rivers, and public safety officials using boats are conducting water rescues. You recognize buildings, road signs and other landmarks, quickly understanding that this flood is taking place little more than 15 miles to your north. Most notably, heavy rain is still falling! There is no time to contemplate the significance of what is happening. The forecaster from the midnight shift has been issuing flash flood warnings for four hours and is growing very tired. You step in and begin issuing some of the most strongly worded flash flood warnings of your career within minutes. On the morning of June 14, 2010, this was reality for me.

Late spring had been drier than average in much of central Oklahoma, with Will Rogers World Airport in Oklahoma City reporting a rainfall deficit of more than three inches in May. Only about

See **Flood** on page 4

Meet Your Weather Man: Vivek Mahale

I am Vivek Mahale, and I'm a SCEP meteorologist at the Norman Forecast Office. SCEP stands for Student Career Experience Program. As a SCEP, I conduct the duties of a full-time, entry-level Meteorologist Intern, but on a part-time basis as I attend school. The job duties include radiosonde launches, climate reports, answering phone calls, verifying warnings and other duties as needed. Usually I work alongside a full-time Intern, but when Christine Riley left to become a General Forecaster at the Monterey, CA, Forecast Office, I began substituting within the rotation on our Meteorologist Intern desk while the position was being filled.

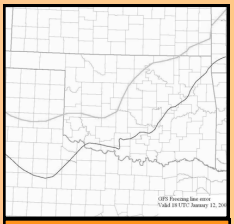


Most meteorologists will tell you he or she became interested in meteorology because of significant weather events during childhood. I can pinpoint my curiosity to understand the atmosphere to a single date - April, 25 1994. That evening I experienced the wrath of a tornado that hit my parents' home in DeSoto, Texas - a suburb on the south side of the Dallas/Fort Worth metroplex. Tornado damage in DeSoto was rated F2 on the Fujita scale. The same storm produced F4 damage in Lancaster, Texas, and killed three people.

See **Vivek** on page 3

New Hampshire Student Researches Arctic Fronts

In 2010, two NWS Norman forecasters, Andrew Taylor and I, volunteered as co-mentors for the Research Experiences for Undergraduates (REU) program hosted at the University of Oklahoma. The REU program is funded by the National Science Foundation, and student participants are selected through a competitive application process. For his interest in operational meteorology, William Leatham III (Bill), an undergraduate student at Plymouth State University in Plymouth, New Hampshire, was chosen to work with us on a ten-week research project. Bill's work culminated in a journal paper and oral presentation.



In this example, an 18-hour forecast of the freezing temperature line (gray line) is much farther north than the observed freezing line (dark line).

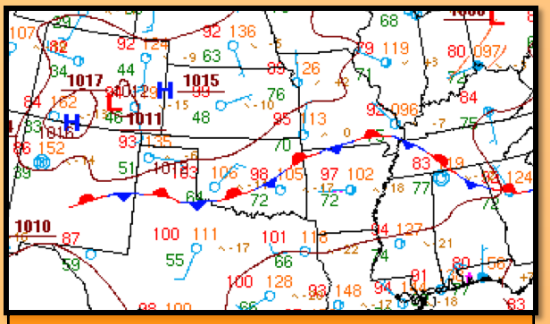
Bill was proactive in contacting us soon after the REU organizers

See **Student** on page 4

Damaging Downburst in Norman

By Lamont Bain
University of Oklahoma
Student Volunteer at NWS Norman

A large subtropical ridge aloft dictated the weather across the southern Plains and the U.S. Desert Southwest from mid July into late August. On August 21st the ridge was centered near El Paso, Texas. A subtle upper-level low was departing the region and was located to the northeast of Oklahoma. Low-level observational analysis revealed that a rich plume of Gulf of Mexico moisture was being pulled ahead of the upper-level

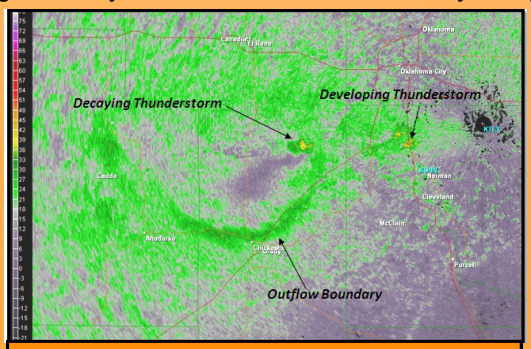


Surface analysis from the Hydrometeorological Prediction Center valid at 4 PM on Saturday, August 21, 2010. It was hot (90s & low 100s) and humid (dewpoints 60s & low 70s) near a stalled front.

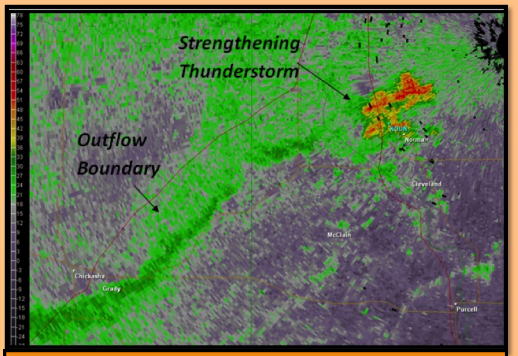
trough. This low-level moisture was evident on data from the weather balloons released at Norman, OK, on both 7 AM and 7 PM launches on August 21st. Above this pronounced moist layer, a region of dry air was evident. This type of configuration of moisture and dry air often represents an unstable situation in which thunderstorms may form. And the summertime heat usually results in high cloud bases and slowly moving storms, a setup for locally strong downdrafts full of high winds and brief heavy rain.

Very hot and muggy conditions were ongoing across much of Oklahoma on August 21st. A cold front was stalled in southwest and central Oklahoma, lying very close to Norman. Daytime heating and convergence along the stalled front primed the environment for thunderstorms. Temperatures reached the upper 90s and low 100s; dewpoints were in the 60s. This yielded, in some instances, a 40-degree difference (in degrees Fahrenheit) between the air temperature and dewpoint temperature. This difference, known as the dewpoint depression, is a useful predictor of thunderstorm hazards. Large dewpoint depression indicates a greater likelihood of damaging thunderstorm winds if any storms are able to develop.

Small thunderstorms initially developed in central Oklahoma late that afternoon, and Doppler radar revealed several small-scale outflow boundaries they had produced. By 6:15 PM a decaying thunderstorm was observed near Tuttle, OK. A very pronounced outflow boundary was apparent from south of Tuttle up through Moore and Norman, where a new thunderstorm was developing. Near 6:40 PM, the developing thunderstorm had moved into the northeast portion of Norman, and was centered just southeast of the intersection of Sooner Road and Rock Creek Road in an area known as Hall Park. At that time, taking advantage of the storm's proximity, forecasters from NWS Norman and the Storm Prediction Center stepped outside their office for a quick visual check on the storm. Timing was fortuitous, as they witnessed the beginning of a rain foot, the distinct foot shaped side of a rain shaft. The rain foot forms as a downdraft hits the ground and winds begin racing out horizontally. This is often a visual marker of damaging downburst winds. Although severe weather had not yet been reported that evening, this visual clue along with the favorable environment suggested there was a high probability that this storm was about to produce very strong winds.



Radar reflectivity from the Twin Lakes (central Oklahoma), KTLX, radar valid at 6:15 PM CDT on Saturday, August 21, 2010.



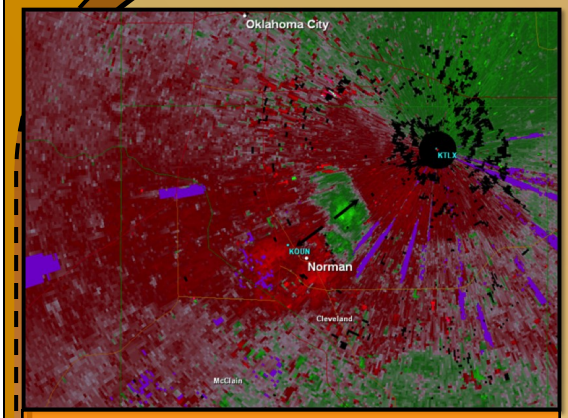
Radar reflectivity from the Twin Lakes (central Oklahoma), KTLX, radar valid at 6:40 PM CDT on Saturday, August 21, 2011.

Continued on Next Page

Brief Heavy Rain

Downbursts may be either "dry" or "wet," and this one was the latter. In what was a very dry month, observers in a small part of northeast Norman reported between one and two inches of rain from this thunderstorm. Unfortunately, these same areas reported the greatest wind damage, and the rain fell over a very short time, resulting in much runoff.

Damaging Downburst...continued



Velocity data from the Twin Lakes (central Oklahoma), KTLX, radar valid at 6:51 PM CDT on Saturday, August 21, 2010. A well-defined downburst signature is present over northeast Norman where, beneath a thunderstorm downdraft, air is racing both toward (green) and away from (red) the radar.

At 6:51 PM CDT, the National Weather Service in Norman issued a Severe Thunderstorm Warning. At the same time that the warning was issued, radar velocity data very suddenly revealed the onset of a damaging downburst. The signature was well-defined. Soon thereafter, reports of severe weather began to pour in from northeast Norman. Storm spotters estimated wind gusts up to 80 MPH. There were reports of trees being snapped as well as shingles being removed from houses. Substantial damage occurred along Robinson and 12th streets. There were numerous reports of power lines down in the same vicinity and just over 2,000 Oklahoma Gas & Electric customers lost power during the storm.

Precipitation Shaft

"Rain Foot"

Photograph of the August 21, 2010, Norman, OK, downburst and rain foot. Photo copyright Brian Squitieri.

The downburst winds flipped a trampoline onto a rooftop. Trampolines can be dangerous places to play during strong winds. Photo courtesy KWTV in Oklahoma City.

Storm Reports

- 12TH TO 24TH AND ROBINSON TO ALAMEDA...4 INCH LIMBS DOWN… POWER POLES SNAPPED...SHINGLES OFF HOMES...FENCES DOWN
- TREE DOWN...SNAPPED OFF. TREE WAS MATURE AND NOT TOTALLY UNHEALTHY...HAVING SURVIVED ICE STORMS
- THREE OR FOUR SECTIONS OF WOODEN FENCE BLOWN DOWN. WINDS ESTIMATED 80 MPH
- WET MICROBURST WITH ASSOCIATED WIND DAMAGE FROM 6:45 PM TO 7:15 PM CDT. ONE-HOUR RAIN TOTAL 1.90 INCES.

Vivek...from page 1

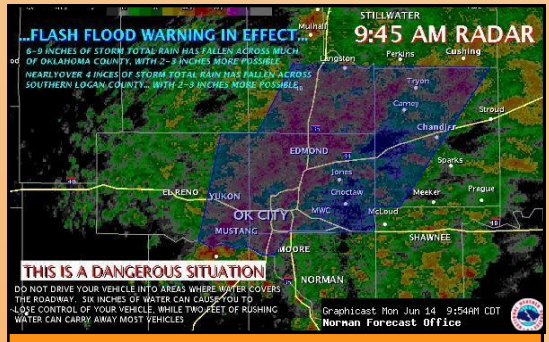
Ironically, Mike Foster, the current Meteorologist-In-Charge at the Norman Forecast Office, was working in Fort Worth at the time, and issued the tornado warning. Little did I know I would be working with Mike over 15 years later! This event demonstrated the benefits of the recently installed NEXRAD system (The Fort Worth, KFWS, WSR-88D radar had just been placed in commission earlier that year). Ever since that day I've been interested in meteorology. My interest was initially a fear of the unknown, but eventually, as I learned meteorology, that fear became a passion. I moved down to Houston, Texas later in 1994. While living in Houston, I would watch meteorologist Dr. Neil Frank at KHOU-TV. He was the former Director of the National Hurricane Center from 1974-1987. My family then moved to Tulsa, OK, where I interned at KOKI-TV with meteorologist Jon Slater in my senior year of high school. My interest in meteorology had steadily grown, and I decided to major in the field.

After high school, I decided to attend the University of Oklahoma (OU) for meteorology. This was an easy decision since I had moved to

See **Vivek** on page 7

June 14, OKC Flood

one quarter inch of rain had been measured at Oklahoma City during the first 13 days in June. Conditions began to change on the evening of the 13th. Thunderstorms had developed ahead of a slow moving cold front stretched from southwest Kansas into the northern Texas panhandle. The storms brought rain to northwest Oklahoma, and a large mass of air – cooled by the rainfall – pushed an outflow boundary south toward central Oklahoma. South winds associated with a low level jet transported Gulf moisture northward throughout the night, and thunderstorm development continued.



Graphicast from NWS Norman emphasizing the dangerous flood that was unfolding in Oklahoma City on the morning of June 14, 2010.

The first thunderstorms developed in central Oklahoma by around 3 AM on June 14th. The outflow boundary had reached a position just south of Interstate 40, where it became nearly stationary through the morning. As the southerly low level jet provided a persistent feed of very moist air, thunderstorms continued to develop and move along the outflow boundary for several hours. Rain from these storms fell at an average of 1 to 2 inches per hour, and sometimes near 3 inches per hour. Persistent and heavy rain occurred in the Oklahoma City metropolitan area through about noon, when the low level jet finally relaxed.

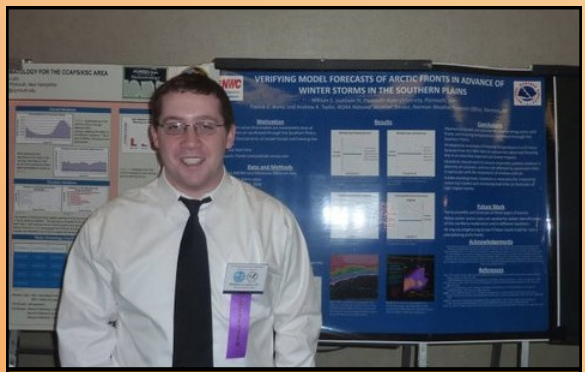
Rainfall at Will Rogers World Airport that day (7.62 inches) totaled much more than the average rainfall for the entire month of June (4.63 inches). Five to nine inch rainfall totals were common in the Oklahoma City area, with some locations in Edmond and north central Oklahoma City measuring between ten and twelve inches! Amazingly, flooding killed only one person on June 14th, and that occurred in Lawton during the afternoon.

Many tools were available to assist forecasters. The Oklahoma Climatological Survey (OCS) had in place a high-resolution network of weather observing stations (OKCnet) around the OKC metro area. Observations from OKCnet enabled us to pinpoint where the greatest rain totals were, and also where rain was accumulating most quickly. The same weather radars that we use to detect severe thunderstorms and tornadoes also produce rainfall estimates for one and three hour intervals and the storm (event) total. Though not as accurate as gauge meas-

See **Flood** on page 8

Student...from page 1

paired us. He immediately demonstrated enthusiasm, and had chosen one of four project ideas that we had submitted. It was refreshing that during the long and hot Oklahoma summer Bill had chosen to study winter storms and arctic cold fronts! Forecasters have long been aware of a deficiency in our ability to model the movement of shallow arctic air. The cold fronts along their leading edge very often plunge southward much faster than forecast. This can wreak havoc by turning a forecast rain event into an ice event, or by causing a forecast ice event to occur much sooner than expected. Bill set out to help quantify this problem by studying four events that had been archived at NWS Norman since 2006.



Bill Leatham presented his REU program research as a poster at the 91st Annual Meeting of the American Meteorological Society.

In considering the position of both the cold front and freezing line at several longitudes and at several forecast times, we were able to sample roughly 200 point forecasts and their associated errors, despite having only four winter storms. Bill found that, on average, the models placed the cold front about 34 miles too far north, and the freezing line about 66 miles too far north. The model errors were generally greater at longer lead times. During one event the models actually forecast the front to retreat northward during the day as heating removed the shallow cold air mass. In reality, clouds that the models had not forecast caused there to be very little heating, and the front instead continued moving south! Bill's study confirmed and placed some specific numbers on what forecasters had been seeing for years. Increased awareness of this problem should aid forecasters when interpreting model forecasts of arctic cold fronts, and hopefully will lead to attempts to improve the model forecasts themselves.

Bill's desire to learn reached beyond his research project as well. He took advantage of many unique opportunities that arose during his ten-week stay here in Norman. This included working one evening shift and one overnight shift to get a feel for the entire operation. A common question I receive from students is "What is shift work like?" Bill now knows firsthand. He also struck a good balance between working diligently on his research and stopping to observe operational meteorology. He watched forecasters several times as they dealt with severe thunderstorms, and he shadowed Andrew Taylor during the June 14th Oklahoma City flood (see page 1 of this issue).

Bill has since stayed in touch with NWS Norman. He has plans to attend graduate school, and hopes to return occasionally to Oklahoma to experience severe storms. We look forward to seeing Bill succeed as he embarks on a career in meteorology.

Norman Office Forecast Notebook - A Complete Look at Events and Happenings

Norman Intern Promoted to Forecaster

Former NWS Norman Meteorologist Intern, Christine Riley, won't be working any blizzards in the near future (Christine had requested we use this picture of her for the "Meet Your Weather Woman" article in the Winter 2010 issue). During Summer 2010, Christine was promoted to General Forecaster at the NWS Forecast Office in Monterey, California. That office is very close to Christine's home town, and while she made the most of her experience here in Oklahoma and Texas, she is excited to be back in the Golden State. The Monterey Office forecasts for a long stretch of coastline that includes the Pacific Coast Highway, Big Sur, and San Francisco. With the abundance of foggy days along that stretch of coast, aviation forecasting is a significant challenge for the Monterey Office, and Christine spent some of her first days there traveling to meet airport staff and become familiar with their operations.

New Intern

Christine's replacement is Marcus Austin who began work in the entry-level, full-time position known as Meteorologist Intern at the start of 2011. Marcus recently earned a Master's Degree in Meteorology at Florida State University. He is excited about severe weather, and he is excited to be returning to his home state; Marcus was born in Miami, Oklahoma. He is be joined here by his wife, Sharon. Welcome Marcus!

Earthquake!

On Wednesday, October 13, 2010, residents of central Oklahoma received a shock from below. According to the United States Geological Survey, at 9:09 am CDT, a magnitude 4.3 earthquake occurred 5 miles east-southeast of Norman. Small earthquakes are relatively common to central Oklahoma, but few are felt by more than a small number of people. The October 13th quake rolled for several seconds before ending with a strong jolt. It was felt as far away as Arkansas, north Texas, and southeast Nebraska. No significant damage was reported.

Passing of Several NWS Friends

EMERGENCY MANAGEMENT

2010 saw the passing of several partners and friends of the National Weather Service.

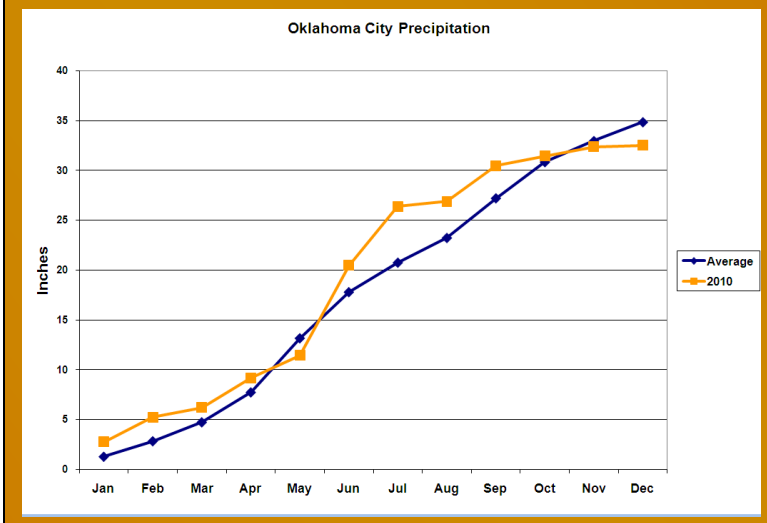
Billy Bankston - Billy served as Beckham County Emergency Manager for 12 years and before that was a member of the Elk City Fire Department.

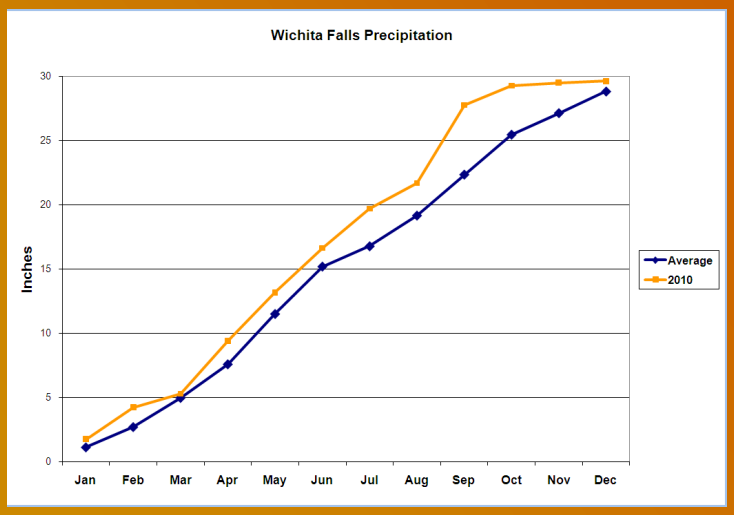
Dwight Dennis - Dwight worked for the city of Altus for 30 years, both as Emergency Manager and Communications Director.

Lyndel Hamilton - Lyndel was the Washita County Emergency Manager at the time of his passing. He and his wife were loyal attendees at the National Severe Weather Workshop each year.

Dave Wallace - Dave was a dedicated meteorologist and amateur radio storm spotter (KC5ZNB) who spent countless hours watching the skies across southwest Oklahoma and north Texas and reporting to the NWS.

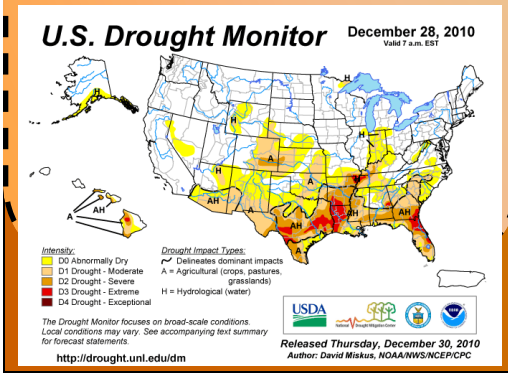
By the Numbers

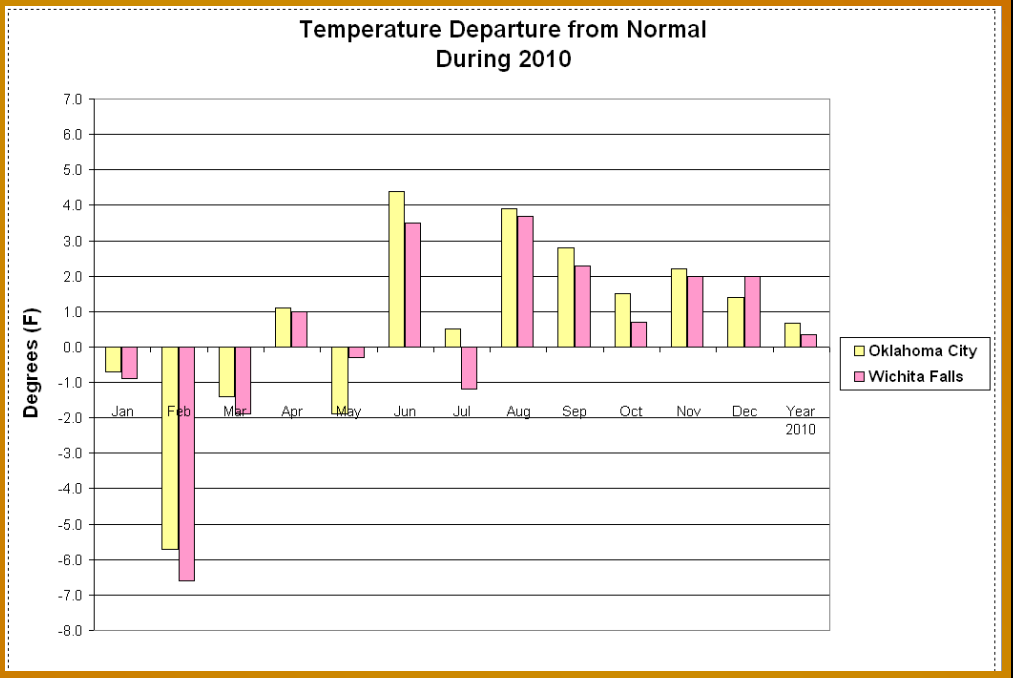




Precipitation

The precipitation graphs for Oklahoma City and Wichita Falls show two traces. The blue trace follow the accumulation of average monthly rainfall. This trace ends at the average yearly rainfall at the end of December (right hand side). The orange trace follows the observed rainfall during 2010. On the whole, both cities did alright, receiving near average precipitation over the year. Wet weather in early summer and again in September actually pushed Wichita Falls above average. The same occurred at Oklahoma City, but then the Oklahoma City rainfall fell back below average by the end of the year. This was part of an uncomfortable trend that shows up at both cities. The orange trace falls flat from September to December. Very little rain fell in those months, leading to short term, and possibly longer term drought.





Temperature

Winter 2010, was certainly cold, with temperatures well below average during February. That month was very cloudy in the wake of a late January winter storm. Much of Spring saw temperatures closer to the long term climatological average, but a hot summer had set in by mid June. And although some early rain and highs just below 100 degrees kept July closer to average, most of the second half of the year saw monthly mean temperatures of 1 to 4 degrees above average at both Oklahoma City and Wichita Falls. It was during this period that the Southern Plains also dried out, and the onset of drought conditions (at least a short term drought, possibly longer) had begun.

Tropical Tornadoes in September

In 2010, most of the tropical cyclones in the Atlantic Basin affected Central America and

Low contrast tornado near Lone Grove, OK, on September 8, 2010. The tornado was spawned by a mini-supercell within an environment of low instability but strong wind shear and low cloud bases surrounding the remnants of Tropical Storm Hermine.

the far western Gulf of Mexico. Early in September, however, one storm, Tropical Storm Hermine, was drawn northward into Texas and Oklahoma. On the evening of September 8th, several tornadoes developed in and around Dallas, Texas. In the Norman Office County Warning Area the remnants of Hermine brought heavy rain and three tornadoes. The most significant tornado occurred earlier in the afternoon near Colbert in Bryan County. Two homes sustained moderate damage and two trucks were overturned along Highway 69. One of the drivers sustained minor injuries. The tornado also downed 15 steel transmission lines, leaving at least 1000 people temporarily without power.

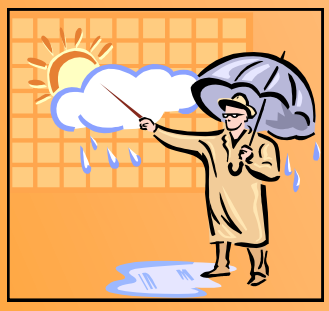
Later that evening brief tornadoes occurred, one near Marietta and another near Lone Grove, OK. The tornado near Lone Grove caused minor damage to two homes between Prairie Valley Road and Rolling Hills Road.

Photos of damage caused by a tornado that struck near Colbert, OK, on September 8, 2010. Photos courtesy Calera, OK, Emergency Manager, Joe Scalf.

Vivek...from page 3

Tulsa, Oklahoma during my freshman year of high school. I volunteered/job shadowed at the National Weather Service Forecast Office in Tulsa during my junior year. It was an exciting experience that made me look forward to studying meteorology at the college level. I graduated from Jenks High School in May of 2005, and went off to OU that fall. While at OU, I interned at KOCO-TV under meteorologist Rick Mitchell my sophomore and junior years. I also delivered the weathercast on OU Nightly (OU's student-run newscast). This newscast was eventually broadcast on Cox Cable in Oklahoma City and Tulsa!

During my senior year I inquired about volunteering at the Norman Forecast Office. I began volunteering during the spring semester. At the same time I found out that I was accepted to graduate school at OU under the advisement of Dr. Howard Bluestein and Dr. Jerry Brotzge. My Master's Degree research involves using CASA (Collaborative Adaptive Sensing of the Atmosphere) dual-polarimetric X-band radars to analyze stormscale and mesoscale features in convective storms—especially those with tornadoes. Dual-polarimetric radars send out both a horizontal and vertical radar beam instead of a single horizontal beam as

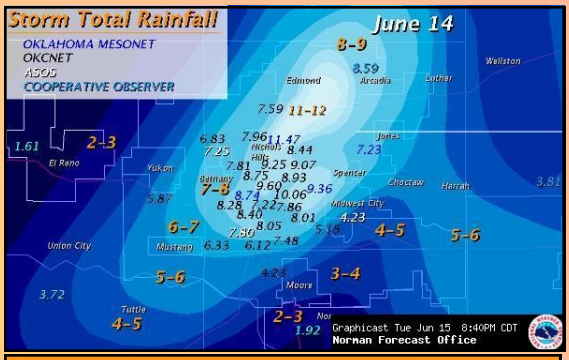


is the case on the current WSR-88D system. The two-beam technique gives information on the shape of precipitation, making it easier to determine rain versus snow versus hail. Very soon all WSR-88D radars will be converted to dual polarimetric, so it is imperative for meteorologists to have an understanding of how to use the additional data. Since I knew I was going to attend graduate school at OU, when I saw an e-mail about the SCEP program, I decided to apply. To my excitement, I found out later that spring that I had been selected to be a SCEP in Norman. I graduated *summa cum laude* with a B.S. in Meteorology in May of 2009. I began work as a SCEP and began working on my M.S. in Meteorology that summer.

The best part of working at the Norman Forecast Office is experiencing operational meteorology and applying the theory that I'm learning in the classroom. It is a definite complement to the classroom that furthers my education and interest in meteorology!

Flood...from page 4

urements from the ground, radar estimates can be compared with the available gauge measurements, and radar provides a more complete areal picture. The Flash Flood Monitoring Program (FFMP) on our workstations here in the office compares radar rainfall estimates with forecasts of the amount of rain that is likely to produce flash flooding. Those forecasts come from the Arkansas Basin River Forecast Center (ABRFC) located in Tulsa, Oklahoma. They consider soil and vegetation types, the current levels of water in the ground, rivers, and reservoirs, and many other factors in producing their flash flood guidance products. Using flash flood guidance within the FFMP software, we can get a good idea of the likelihood of flash flooding at the resolution of individual drainage basins, sometimes as small as a few city blocks.



Labeled, contoured, and shaded plot of observed rain totals from the June 14, 2011, flood in Oklahoma City. The swath of heaviest rain was oriented southwest to northeast from Tuttle through Nichols Hills and Edmond.

Tools such as the ones mentioned above are helpful in determining whether flash floods may be occurring. By mid-morning on June 14th, there was no doubt! It was apparent from the live television coverage and conversations with local public safety officials that at least minor flooding was occurring in several locations that rarely flood, and that travel through flood prone areas could be life-threatening to those who attempted it. The continuous feed of up-to-date information enabled us to include helpful details in our warnings. Flooding often lasts well after rainfall ends, especially near rivers and streams. Live coverage helped us to know when water receded enough to let flood warnings expire. Along rivers, flooding lasted more than 48 hours! In the six months preceding June, the Norman Forecast Office dealt with a number of high impact weather events, including an intense blizzard, a crippling ice storm, a tornado outbreak, and a damaging metro area hailstorm. Meteorologists are uniquely accustomed to handling uncertainty and to being presented new challenges each time we arrive at work.

One might imagine that during these events the atmosphere inside the Forecast Office is frenzied, like that of the stock exchange floor. Nothing could be farther from the truth! The noise level is elevated as we share information across the room. But someone entering the office during a major event might be surprised at the relative calm. Everyone is busy analyzing the inputs of our scientific tools and ground truth reports during these rapidly changing situations. Our goal is to keep useful information and safety recommendations flowing back out to the public when minutes and seconds count.

Dewpoint

A “batch” or “parcel” of air can be described by several measures such as temperature, pressure, etc. The dewpoint temperature (or simply dewpoint) describes the temperature to which a parcel of air must be cooled, while holding its pressure constant, to reach saturation. The dewpoint is closely associated with relative humidity. The relative humidity is high when the dewpoint is near the same value as the ambient air temperature. The air is saturated with respect to water vapor when the relative humidity is 100%, indicating that the dewpoint and air temperature are the same. When the dewpoint remains constant and temperature increases the relative humidity will decrease. The same will occur if temperature remains constant and dewpoint decreases.

Dewpoints often decrease as dry air moves in behind a cold front or a dry line. In Oklahoma and Texas, dewpoints can drop below zero degrees Fahrenheit after the passage of an arctic cold front or a strong dryline. At the other end of the spectrum, dewpoints can reach very high values during the summer months. Most of the time, increased dewpoint temperatures can be attributed to one or more of the following: air from the Gulf of Mexico; recent heavy rainfall; green vegetation yielding moisture to the air. An example of extreme dewpoints in Oklahoma occurred on July 28, 1995 when the Oklahoma Mesonet recorded dewpoints of 87 degrees at both Broken Bow and Cloudy, Oklahoma. More recently, dewpoints reached the low 80s across central and southeastern Oklahoma in early June 2010, during a period when heavy rain was frequent, vegetation was green, and heating was occasionally strong enough to cause strong transport of ground moisture into the air. If these high dewpoints combine with hot temperatures, stress can increase on the human body and the risk of heat exhaustion and heat stroke rises dramatically.

Weather Words

COOP Observer Notes

NEWS

Joe & Lois Carter Pontotoc, OK 20 Year Service Award!

Bill King Atoka, OK 10 Year Service Award!

Tim Cannon Tecumseh, OK New Observer!

In Remembrance: Tony Albers, Sr.

Union City, OK, COOP observer, Tony Albers, Sr., passed away September 6, 2010, at the age of 96. Tony was born in Tecumseh, NE, on May 10, 1914, but he spent most of his life on his family's farm southeast of Union City. Tony's father had brought Oklahoma's first herd of Red Poll cattle from Nebraska to Oklahoma. Tony carried on his father's work by raising Red Poll cattle while also farming wheat, cotton, and other crops. He was an active member of his local community, serving on several boards and commissions.

Tony was a great friend of the National Weather Service in Norman; he served as a COOP observer for more than 50 years. The Albers family began weather observations on February 1, 1923. Tony Albers, Sr., took over in 1946, and remained as observer until 1998, when the duty was passed on to his son, Tony, Albers, Jr. In 1992, Tony, Sr., was recognized for outstanding weather observations with his receiving the John Campanius Holm Award, the second highest honor given to NWS observers. The Albers family continues observations at Union City to this day.

Troy Gibson

Comanche, OK, COOP observer, Troy Gibson, passed away in November 2010. Troy's wife, Audrey Gibson, will continue observations at Comanche.

The Carter family in Pontotoc, OK, is another great friend of NWS Norman. Joe Carter, Jr., who served as a rainfall observer for 20 years, passed away August 23, 2010. His wife, Lois, will continue the family's observations.

Joe Carter, Jr.

The Norman NWS Cooperative Observer Program Team:

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Thanks for Reading!

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Please share this with friends, relatives, and colleagues. Comments and suggestions are always appreciated: by phone at 405-325-3816 or by e-mail at Patrick.Burke@noaa.gov.